targeted for ACL injury prevention efforts. Therefore, the objective of this study was to determine if history of specific MSK injuries are prospective risk factors for incident ACL injury.
Methods: Healthy, physically active first year cadets (n=5,689, males=3,496; females=2,193; age=18.6±0.6 yrs, ht=173.5±9.2 cm, wt=71.9±12.9 kg) were enrolled between 2005 to 2009 at the U.S. Military, U.S. Air Force and U.S. Naval Academies. Participants completed a self-report injury history questionnaire on prior injuries to the lower extremity over the past 6 months. History of the following specific injuries was obtained: ankle sprain, shin splints, knee swelling/popping, knee meniscus injury, patellofemoral pain, and hip injury. Active surveillance was conducted for all participants with no prior history of ACL reconstruction at study baseline and participants were followed prospectively through the closed healthcare system at each site during their four years at each academy. Separate poisson regression models were used to estimate ACL injury incidence rate ratios for each MSK injury (adjusted for gender, testing site, and year of enrollment).
Results: Of the 5,689 participants with no prior history of ACL reconstruction, 117 were later diagnosed with an incident ACL injury during the 4-year follow up period. The 4-year risk of ACL injury was 2.0% (95% confidence interval [CI] = 1.7%, 2.4%). Participants with a previous history of an ankle sprain were at increased risk for incident ACL injury (rate ratio [RR] = 1.89, 95% CI = 1.25, 2.86, p = 0.002). Risk of ACL injury was not influenced by prior history of shin splints (RR = 1.01, 95%CI = 0.69, 1.48, p = 0.96), knee swelling/clicking (RR = 1.01, 95%CI = 0.67, 1.51, p = 0.97), severe knee pain (RR = 1.06, 95%CI = 0.54, 2.10, p = 0.85), knee meniscus injury (RR = 1.12, 95%CI = 0.28, 4.53, p = 0.87), patellofemoral pain (RR = 0.95, 95%CI = 0.55, 1.63, p = 0.84), or hip injury (RR = 0.87, 95%CI = 0.28, 2.75, p = 0.81).
Conclusions: These results suggest that at least one baseline injury history factor (history of an ankle sprain) could be used by health care providers to target ACL injury prevention efforts. Interestingly, prior injury to the hip, knee and shin were not associated with future ACL injury risk. Ankle sprain events may be similar to ACL injury events in that an unexpected perturbation occurs where the neuromuscular system is unable to mitigate injury forces. Because ACL injury is most common in people between the ages of 15-24 years, these individuals develop knee OA very early in life adding to a myriad of inactivity related physical and psychological co-morbidities. Targeting individuals with a history of ankle sprain for ACL injury prevention efforts may help prevent incident ACL injury and subsequently reduce the risk of knee OA development. (Funded by the NIAMS Division of the National Institutes of Health, #R01-AR050461001)

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EPIDEMIOLOGY OF SHOE WEARING PATTERNS OVER TIME IN OLDER WOMEN: ASSOCIATIONS WITH CURRENT FOOT PAIN AND HALLUX VALGUS

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Purpose: Foot pain, deformity and osteoarthritis are highly prevalent in older women and are thought to be associated with the wearing of footwear with a constrictive toe box and elevated heel. The aims of this study were to (i) examine shoe wearing patterns over time in older women in relation to the shape of the toe box and the height of the heel, and (ii) evaluate associations between these footwear characteristics and current foot pain and hallux valgus.
Methods: Participants were women aged ≥50 years registered with four general practices in North Staffordshire who completed a Health Survey. The survey included a footwear question in which participants were presented with line drawings of four toe box shapes (broad, slightly narrow, moderately narrow and very narrow) and four heel heights (flat, low, medium and high). For each period of their life (divided into decades, commencing with 20-29 years of age), participants were asked to indicate which toe box shape and heel height they wore most of the time. Participants were asked whether they had current pain in and around their foot, and self-reported hallux valgus was assessed using a validated line drawing instrument. Associations between footwear characteristics (toe box shape and heel height), foot pain and hallux valgus were examined using logistic regression.
Results: Health Surveys were received from 2,670 women (mean age 65.6 years, SD 9.9). The wearing of shoes with a very narrow toe box and high heel between the ages of 20-29 years was common (38% of the sample) but decreased to less than 10% by the age of 40 years. A cohort effect was observed, whereby women born in the 1940s were more likely to wear shoes with a narrower toe box and higher heel aged 20-29 years (i.e. during 1960s). Current foot pain was not associated with toe box shape or heel height. However, a dose-response relationship was observed between narrow toe box footwear worn aged 20-29 years and risk of hallux valgus aged 50+ years (compared with broad toe box: crude OR (slightly narrow): 1.96; 95% CI 1.03, 3.71), OR (moderately narrow): 2.39; 1.29, 4.42); OR (very narrow): 2.70; 1.46, 5.00). Increased risk of hallux valgus was also evident in those who wore shoes with a very narrow toe box (1.93, 1.10 to 3.39) aged 30-39 years. These associations appeared consistent when stratified by 10-year birth cohort.
Conclusions: Women tend to wear shoes with a broader toe box and lower heel as they age. However, wearing constrictive footwear between the ages of 20 and 39 years may be a critical period of exposure for the development of hallux valgus in later life.

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EXERCISE VERSUS ANALGESICS FOR KNEE OSTEOARTHRITIS PAIN: A META-EPIDEMIOLOGICAL STUDY OF COCHRANE SYSTEMATIC REVIEWS

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Purpose: To estimate the comparative effectiveness of exercise interventions versus orally administered analgesics (pharmacological pain relief interventions) for pain in patients with knee osteoarthritis (OA).
Methods: The Cochrane Database of systematic reviews was searched for meta-analyses of randomised controlled trials (RCTs) comparing exercise versus orally administered analgesics, with a control group (placebo or usual care) and with pain as an outcome. From the included reviews, individual studies were identified and assessed for eligibility. Eligible studies had to be RCTs with an intervention control (sham, placebo, or no intervention), include patients with knee OA, and include pain as an outcome. From the eligible studies information about intervention (drug name or exercise type), comparator type, number of participants, pain measure, and effect estimates on pain (either by groups or as differences among groups) were extracted. If more than one analysis on pain was included in a study, we extracted estimates from the first analysis presented in the Cochrane review, assuming it to be the main analysis on pain. The extracted effects on pain were standardised and presented as standardised mean differences (SMDs). We combined study-level effects on pain with a mixed effects meta-analysis (study as random) and compared effect sizes between exercise trials and trials with analgesic interventions (intervention as fixed). SAS v 9.3 was used for the analyses, based on a Restricted Maximum Likelihood (REML) model. Fixed effects analysis was used to test the robustness of the findings. Secondary analyses were done stratifying by specific intervention (type of analgesic and exercise type).
Results: We included six Cochrane reviews (four pharmacology, two exercise). From these reviews, 54 trials were eligible (20 pharmacology, 34 exercise), with 9,806 participants (5,627 pharmacology, 4,179 exercise) in 56 comparisons (35 exercise and 21 analgesics). The exercise studies included land based and aquatic exercise, and the studies on analgesics included acetaminophen, NSAIDs, and opioids. The pooled effect size of pharmacological pain interventions was 0.41 SMD (95% confidence interval (CI): 0.23 to 0.59; P<0.0001) and for exercise it was 0.46 SMD (95% CI: 0.34 to 0.59; P<0.0001). Across all studies, the overall between-study heterogeneity was considerable, with an inconsistency index (I2) of 54% (48% in the exercise trials and 63% in the pharmacology trials). There was no statistically significant difference between the two types of intervention (difference: 0.06 SMD (95% CI: -0.28 to 0.16; P = 0.61). The fixed effects analysis, however, resulted in a statistically significant difference of 0.10 (95% CI: 0.01 to 0.19) in favour of exercise, indicating serious inconsistency in the available data. In the stratified analysis we found no statistically significant differential responses on pain.
Conclusions: This meta-epidemiological study provides indirect evidence that for knee OA pain, the effects from exercise and from oral analgesics are comparable. These results may support clinical management of patients who for some reason are unable to exercise or who consider exercise as unviable and analgesics as a more feasible choice.